2.1 Describe the process of translating a program written in a High-Level Language (HLL), e.g. C++, into an executable file that is ready for execution. Identify the system programs used in the process and describe the role of each of them assuming that the compiler generates an assembly language file as the output.

**Answer:** Complier complies the HLL program into assembly language program, and assembler translate the assembly code into object code. After that, the linker combined all the modules and files, and translate them into executable file for the computer to run.

What is the system program used by the Operating System (OS) to load an executable file to memory and run it?

**Anwser:** Loader

2.2 Describe the elements, including optional ones, of a MIPS assembly language statement.

**Answer:** Each instruction or statement is made up of label, operation, operands & comments. Only the operation is required for every statement, the others are optional. Labels are used as symbols or markers that tell the assembler the exact memory. Operations decided which type of instruction or assembler directive to do. Operand can be register names, immediate value or address label that decided the outcome of operation. And comments are provided explanatory notes of each instruction. It’s only for human, and ignored by assembler.